



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/781,644  
Applicants : Won Nam KANG et al.  
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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION UNDER 37 C.F.R. § 1.131**

We, Won nam Kang, Sung-ik Lee, Eun-mi Choi and Hyeong-jin Kim, declare as follows:

1. We are the co-inventors of the above-captioned U.S. patent application.
2. Attached are Exhibits A, B, C and D.
  - a. Exhibit A is a copy of an invention disclosure, the original of which was prepared in a WTO member country, South Korea, (prior to March 9, 2001) but not prior to January 1, 1996. Exhibit A describes our invention as shown below.
  - b. Exhibit B is a certified English translation of Exhibit A.
  - c. Exhibit C is the cover page of the fax transmittal of the invention disclosure to Y.P. Lee & Mock, the inventors' patent representative in Korea. The cover page has a printed transmission date "2001. 3. 9." and a dated receipt stamp showing "01. 3. 09" on its face.
  - d. Exhibit D are copies of emails communicated between Ms. Kilja Kwon, who drafted a patent application for the invention disclosure, and the inventors in preparation of the final draft of the application.
3. Independent claim 1 is set forth in bold below. The support in Exhibit A for each recited element is set forth in brackets right below the corresponding claim element.

**A method for forming a superconducting magnesium diboride ( $\text{MgB}_2$ ) thin film, the method comprising:**

[Page 1, line 2 describes a method for forming a superconducting magnesium diboride ( $\text{MgB}_2$ ) thin film.]

**forming a boron thin film on a monocrystalline sapphire substrate or a monocrystalline strontium titanate substrate**

[Page 2, lines 24-25 describes a monocrystalline sapphire substrate and a monocrystalline strontium titanate substrate were used to produce magnesium diboride thin film.]

**by pulsed laser deposition, sputtering deposition, electron beam evaporation, metallorganic chemical vapor deposition, or chemical vapor deposition;**

[Page 2, lines 18-19 describes forming a boron thin film on a substrate using laser.]

**thermally processing the substrate on which the boron thin film is formed along with a magnesium source and cooling the resulting structure,**

[Page 2, lines 37-38 describes thermally treating at  $600^\circ\text{C}$ - $1000^\circ\text{C}$  a boron thin film and magnesium. Page 3, lines 10-12 describes heating a sample in an electrical furnace at  $600^\circ\text{C}$ - $1000^\circ\text{C}$  and cooling the sample.]

**the substrate having the boron thin film and the magnesium source being double sealed with a container made of tantalum or niobium on the inside and a container made of quartz on the outside;**

[Pages 3, lines 2-6 describes a double sealed heat treatment device wherein a tantalum tube contains magnesium and boron thin film and a quartz tube protects the tantalum tube from oxidation.]

**placing the substrate with the boron thin film and the magnesium source in a heat source having a temperature equal to or greater than  $600^\circ\text{C}$  and less than  $950^\circ\text{C}$ ; and**

[Pages 2, lines 37-38 describes thermally treating at  $600^\circ\text{C}$ - $1000^\circ\text{C}$  a boron thin film and magnesium. Page 3, lines 10-12 describes heating a sample in an electrical furnace at  $600^\circ\text{C}$ - $1000^\circ\text{C}$  and cooling the sample.]

**rapidly heating the substrate with the boron thin film and the magnesium source for 10-60 minutes, and then cooling the substrate,**

[Page 3, lines 6-8 describes maintaining heat treatment as briefly as possible to reduce chemical side reactions during film production. Page 3, lines 11-12 describes finishing heat treatment within 2 hours.]

**wherein both ends of the container made of tantalum or niobium are sealed in an inert gas atmosphere, and both ends of the container made of quartz are sealed in a vacuum.**

[Page 3, lines 35-36 describes sealing a tantalum tube in an inert gas atmosphere. Page 3, line 13 describes a film-growing tube in a highly vacuum state.]

4. During the period, which is prior to March 9, 2001 and until the patent application was filed with the Korean Patent Office on March 19, 2001, we exercised reasonable diligence in assisting with the preparation and finalization of the patent application for filing in the U.S. Patent and Trademark Office. Specifically, on March 9, 2001, Friday, we faxed our invention disclosure to our patent representative for preparation of a patent application. On March 17, 2001, Saturday, Mr. Kang, one of the inventors, reviewed a draft application, and sent a revision on March 18, 2001, Sunday. The application was filed on March 19, 2001, Monday.

**DECLARATION UNDER 37 C.F.R. § 1.68**

All statements made herein of our own knowledge are true and all statements made on information and belief are believed to be true. All statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: Aug. 11. 2006

  
Won nam Kang

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Dated: Aug. 11, 2006

  
Sung-ik Lee

Dated: Aug. 11, 2006

  
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